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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/541,175  | 06/30/2005  | Masanori Shojiya     | 14434.85USWO        | 4887             |
| 52835 7590 01/06/2010<br>HAMRE, SCHUMANN, MUELLER & LARSON, P.C.<br>P.O. BOX 2902<br>MINNEAPOLIS, MN 55402-0902 |             |                      |                     |                  |
| EXAMINER<br>HOBAN, MATTHEW E  |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/541,175

**Applicant(s)**

SHOJIYA ET AL.

**Examiner**

Matthew E. Hoban

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/22)  
Paper No(s)/Mail Date 10/19/2009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed 10/19/2009 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 8, 13 and 15 rejected under 35 U.S.C. 102(b) as being anticipated by Stookey in 2920971.

Stookey teaches crystallizable glasses of various compositions. Examples of these glasses are shown in Tables II-XIV. Of the examples shown, Example 10 falls within the ranges of the instantly claimed invention. When the components of this glass are converted to a molar basis, the composition is 46.82 mol% SiO<sub>2</sub>, 19.47 mol% Al<sub>2</sub>O<sub>3</sub>,

23.02 mol% MgO, and 10.69 mol% TiO<sub>2</sub>. This composition is free of Y<sub>2</sub>O<sub>3</sub> and alkali metal oxides.

3. Claims 1-7, 9, and 11 rejected under 35 U.S.C. 102(b) as being anticipated by Sakka in his publication entitled "The Si-O bonding in Na<sub>2</sub>O-TiO<sub>2</sub>-SiO<sub>2</sub> and K<sub>2</sub>O-TiO<sub>2</sub>-SiO<sub>2</sub> glasses as studied by SiKB X-ray fluorescence and infra-red absorption spectroscopy".

Sakka teaches glasses having the following amounts of Na<sub>2</sub>O:TiO<sub>2</sub>:SiO<sub>2</sub> in mol%: 20:20:60, 20:30:50, 25:25:50, 30:20:50, 20:40:40, 25:35:40, 30:30:40, and 40:20:40. All of these compositions read on the composition claimed in Claim 1-2, wherein silica is a network forming oxide, and sodium is a network modifying oxide. These samples would inherently have a value of  $f_m$  lower than 1.35,  $F_m$  less than 400 kJ/mol,  $F/a < .13$ , the relevant amount of Si-O-Ti, and the values delineated in Claim 7. Sakka teaches a composition of 20:30:50, which is extremely close in composition to that of Example 16 of the instant specification. This example shows an  $f_m$  value of 1.276, an  $F_m$  value of 377 kJ/mol,  $F/a$  of .111, and the relevant values of Ti-O-Si bonds and the relationships shown in Claim 7. Therefore, at least this composition inherently holds all of the claimed properties. It is expected that other compositions would also hold such values; however, based on the similarity of what is shown by Sakka and what is shown in the instant specification, this composition is the most relevant.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Zou in 6294490.

**Regarding Claim 8:** Zou teaches a glass composition under one aspect of his invention that has a composition including in mol%, from 0-2-10 mol%  $\text{Li}_2\text{O}$ , 5-15%  $\text{TiO}_2$ , 10-40%  $\text{MgO}$ , 5-25%  $\text{Al}_2\text{O}_3$ , and 35-65%  $\text{SiO}_2$  (See Column 5, Lines 26-47). Yttria is not included in this base composition. As can be discerned, Zou's range of compositions represents an overlapping range of compositions with the claimed composition. It would have been obvious for one of ordinary skill in the art to chose from the portion of such overlapping ranges and necessarily arrive at the claimed composition. . "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). See MPEP 2144.05.

8. Claim 10 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Sakka in his publication entitled "The Si-O bonding in  $\text{Na}_2\text{O-TiO}_2\text{-SiO}_2$  and  $\text{K}_2\text{O-TiO}_2\text{-SiO}_2$  glasses as studied by SiKB X-ray fluorecence and infra-red absorption spectroscopy" as applied to claim 1-2 and 11 above, and further in view of either Montgomery in 1513923.

Sakka teaches the glass composition of claims 1-2 in a variety of forms.

Sakka is silent as to the use of fining agents such as  $\text{Sb}_2\text{O}_3$ .

However, the use of antimony as a fining agent is well known in the art.

Montgomery shows its use in glasses that are typically hard to fine. One of ordinary skill in the art would be motivated to include a fining agent in the glass in order to remove impurities and bubbles from the glass composition. This leads to a better/higher purity glass. The addition of a fining agent would be extremely useful and nearly necessary when such glasses were mass produced.

Therefore, the addition of a fining agent would be obvious to one of ordinary skill in the art. As antimony is a typical fining agent, as shown by Montgomery, one would find it obvious, and well motivated to use this particular oxide.

9. Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Stookey in 2920971 as applied to claim 8 above, and further in view of Sohn in their publication entitled "Crystallization behavior in the glass system  $\text{MgO-Al}_2\text{O}_3\text{-SiO}_2$ : influence of  $\text{CeO}_2$  addition".

Stookey teaches the glass composition of claim 8 in one of his examples, wherein he teaches crystallizable glasses that crystallize after heat treatment.

Stookey is silent as to the addition of  $\text{CeO}_2$ .

However, Sohn teaches the beneficial nature of  $\text{CeO}_2$  as an additive in the  $\text{MgO-Al}_2\text{O}_3\text{-SiO}_2$  system, especially on the heat treatment induced crystallization of this system. Cerium additions to this glass effectively lower the crystallization and glass transition temperature of the glass, and allow it to precipitate only alpha cordierite rather than a mixture of alpha and gamma cordierite. Therefore, one of ordinary skill in the art would find that the addition of cerium to the compositions taught by Stookey would be beneficial in the creation of glasses precipitating certain phases. This is due to the fact that Stookey explicitly teaches his glasses as capable of this glass to glass-ceramic transition. One of ordinary skill in the art would therefore experiment with the use of cerium oxide in this system to find an ideal amount of added cerium in order to impart the beneficial properties taught by Sohn. Such experimentation and the resulting incorporation of ceria in the glass composition would obviate the claimed composition.

### ***Response to Arguments***

10. Applicant's arguments filed 9/17/2009 in regards to the rejection of claim 9 over Zou have been fully considered but they are not persuasive. Zou teaches other embodiments without the required alumina/magnesia ratio. This embodiment teaches a required amount of lithium. The amendments to claims 13 and 14 and new claim 15 overcome Zou, but the independent claim is still rejectable over Zou.

11. Applicant's arguments with respect to claims 1-7 and 9-14 have been considered but are moot in view of the new ground(s) of rejection. New art has been applied rejecting these claims that overcomes the amendments to the claims and the arguments thereto. No additional comment on the arguments is deemed necessary at this time as the newly applied art is not relevant to the arguments.

### ***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Hoban whose telephone number is (571)

270-3585. The examiner can normally be reached on Monday - Friday from 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew E Hoban/  
Examiner, Art Unit 1793

/C. Melissa Koslow/  
Primary Examiner, Art Unit 1793